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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-2864
Plant ID No.:	035-00049
Applicant:	Armstrong World Industries, Inc.
Facility Name:	Millwood Facility
Location:	Millwood, Jackson County
NAICS Code:	327993
Application Type:	Construction
Received Date:	November 3, 2010
Engineer Assigned:	Steven R. Pursley, PE
Fee Amount:	$2,000.00
Date Received:	November 4, 2010
Complete Date:	December 2, 2010
Due Date:	March 2, 2011
Applicant Ad Date:	November 2, 2010
Newspaper:	*Jackson Newspapers*
UTM's:	Easting: 427.2 km Northing: 4,307 km Zone: 17
Description:	Construction of a slag wool manufacturing facility.

DESCRIPTION OF PROCESS

The proposed new facility will consist of one furnace and two slag wool production lines, and other associated operations dedicated to manufacturing slag wool.

The proposed slag wool production facility will utilize slag as a raw material input. Slag from external sources will be delivered to the Millwood Plant via truck or railcar and unloaded into slag storage piles. The slag will be conveyed from storage to the furnace via a series of raw material conveyors and hoppers, which are all controlled by the furnace dust collector.

Upon feeding the slag to the furnace, the furnace will melt the slag. The molten metallics will be tapped from the furnace bottom periodically, cooled and sold externally. Emissions of SO_2 from the furnace, which evolve through the oxidation of sulfur impurities contained in the slag, will be controlled by a dry scrubber. The scrubber reagent will be fed to the scrubber from a storage silo equipped with a bin vent filter. Particulate emissions

from the furnace will be controlled by the furnace dust collector located downstream from the dry scrubber.

The upper layer of molten slag will be continuously discharged into spinners to produce slag wool fiber. The spinning lines discharge the wool fibers to collection chambers. The slag wool fibers are then processed through a series of fiber conditioning equipment.

Many of the operations in the slag wool production lines are designed to remove a significant portion of shot from the slag wool fiber stream. Particulate emissions from each of the duplicate fiber lines will be controlled by a separate dust collector. The dust collectors will, however, share a single exhaust stack.

The following equipment will also be part of the Millwood Plant to support the slag wool production operations: housekeeping vacuum system for plant maintenance, plant roadways and parking areas, diesel storage tanks, glycol additive storage tank, cooling tower and a backup electrical generator.

SITE INSPECTION

A site inspection of the proposed facility was performed by the writer on January 18, 2011. The facility will be located in the Jackson County Maritime and Industrial Center near Millwood, WV. Significant excavation has already begun although none was being performed during the site inspection. To get to the facility drive north on Interstate 77 to the Ripley exit. Turn left on State Route 62 and go approximately 9 miles until Route 62 dead ends at State Route 2. Turn right and go approximately 1.3 miles and the entrance to the Jackson County Maritime and Industrial Center is on the left. Turn left into the Industrial Center and go approximately 0.4 miles. Then veer right and go approximately 0.25 miles and the plant will be on the left.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Controlled criteria pollutant emissions from the facility should be as follows (note that in order to be conservative all PM_{10} is assumed to be $PM_{2.5}$) :

Source	PM		PM_{10}		NO_x		VOC		SO_2		CO	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1S[1]	3.70	16.2	3.70	16.2	5.0	21.9	5.0	21.9	55.94	245	5.0	21.9
3S	10.14	44.4	10.14	44.4	--	--	0.05	0.2	--	--	--	--
4S	10.14	44.4	10.14	44.4	--	--	0.05	0.2	--	--	--	--
5S	0.34	1.5	0.34	1.5	--	--	--	--	--	--	--	--

6S	0.53	2.3	0.53	2.3	--	--	--	--	--	--	--	--
7S	0.26	1.1	0.26	1.1	6.47	28.3	0.21	0.9	0.01	0.04	4.37	19.1
8S[2]	15.6	22.7	4.11	6.0	--	--	--	--	--	--	--	--
9S	0.16	0.7	0.07	0.3	--	--	--	--	--	--	--	--
10S	0.78	3.4	0.78	3.4	--	--	--	--	--	--	--	--
11S	0.03	0.1	0.01	0.04	--	--	--	--	--	--	--	--
12S	--	--	--	--	--	--	0.01	0.04	--	--	--	--
13S	--	--	--	--	--	--	0.01	0.04	--	--	--	--
14S	--	--	--	--	--	--	0.01	0.04	--	--	--	--
15S	3.43	15.0	3.43	15.0	--	--	--	--	--	--	--	--
16S												
17S	0.42	1.8	0.42	1.8	--	--	--	--	--	--	--	--
Total	**45.53**	**153.6**	**33.93**	**136.4**	**11.47**	**50.2**	**5.34**	**23.32**	**55.95**	**245**	**9.37**	**41**

[1]It should be noted that the applicant has stated (and provided documentation from the manufacturer) that no CO, VOC or NO_x will be emitted from the Submerged Electric Arc Furnace. However, in order to be conservative , emissions of 5 pounds per hour (21.9 tons per year) were included in the above estimate. The permit will require testing to ensure that these limits are met.

[2]Maximum hourly haulroad emissions were estimated by assuming all traffic occurs evenly over an 8 hour period per day.

Controlled HAP emissions from the facility should not exceed the following:

Source	Mn		VOC HAP		Total HAP	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
1S	0.26	1.1	--	--	0.26	1.1
3S	0.71	3.1	--	--	0.71	3.1
4S	0.71	3.1	--	--	0.71	3.1
5S	0.03	0.1	--	--	0.03	0.1
6S	--	--	--	--	--	--
7S	--	--	0.01	0.04	0.01	0.04
8S	--	--	--	--	--	--

9S	0.02	0.05	--	--	0.02	0.05
10S	--	--	--	--	--	--
11S	0.01	0.04	--	--	0.01	0.04
12S	--	--	0.01	0.04	0.01	0.04
13S	--	--	0.01	0.04	0.01	0.04
14S	--	--	--	--	--	--
15S	0.23	1.0	--	--	0.23	1.0
16S						
17S	--	--	--	--	--	--
Total	**1.97**	**8.49**	**0.03**	**0.12**	**2.00**	**8.61**

REGULATORY APPLICABILITY

The following state and federal regulations apply to the facility:

STATE RULES:

45CSR7 To Prevent and Control Particulate Matter Air Pollution From Manufacturing Processes and Associated Operations.

The main requirement of 45CSR7 is the process weight rate based PM stack emission rate in section 4 of the rule. The following sources are subject to the process weight rate based emission limitations (all are “type a” sources):

Source	Proc. Weight Rate (lb/hr)	Rule 7 Limit (lb/hr)	Permit Limit (lb/hr)
1S (Raw material transfer and EAF)	26,685	20.01	3.7
3S (Spinner collection chamber #1)	30,360	22.2	20.3
4S (Spinner collection chamber #2)			
5S (Housekeeping vacuum system)	350	0.42	0.34
6S (Hydrated lime storage silo)	40,000	28	0.51
15S (Slag wool processing line #1)	19,532	15.7	3.4
16S (Slag wool processing line #2)			

The facility is also subject to a twenty (20) percent opacity limit on all process source operations and must have a plan to minimize fugitive emissions. Armstrong proposes to meet these requirements mainly through the use of baghouses and water sprays.

The facility is also subject to the fugitive particulate matter control systems requirement of section 5.1 of 45CSR7.

45CSR10 To Prevent and Control Air Pollution From the Emission of Sulfur Oxides.

45CSR10 section 4.1 limits the in stack SO_2 concentration to 2,000 ppm. The only sources of SO_2 emissions from the facility are the EAF and Emergency Generator. According to information submitted with the applicants emission calculations, exhaust from the EAF will be approximately 50,000 acfm. Temperatures of the exhaust are approximately 150°F. Total SO_2 emissions from the EAF will be limited to 55.94 pounds per hour. This yields an in stack SO_2 concentration of approximately 130 ppm.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation).

Because emissions from the facility exceed 6 pounds per hour and 10 tons per year of several criteria pollutants, the applicant is required to obtain a Rule 13 permit prior to construction.

45CSR30 Requirements for Operating Permits.

The facility is subject to 45CSR30 because it emits more than 100 tons per year of SO_2. Additionally, point source emissions of PM_{10} also exceed 100 tons per year.

FEDERAL RULES:

40 CFR 60 Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines.

The permittee intends to install one 565kw diesel fired backup generator. 40 CFR 60 Subpart IIII requires that subject engines meet specific emission standards and fuel specifications. Specifically, the engine will have to meet the following emission limits:

NO_x+NMHC (g/hp-hr)	CO (g/hp-hr)	PM (g/hp-hr)
6.4	3.5	0.20

Additionally, Armstrong will be required to use nonroad diesel fuel that has a sulfur content of less than 15 ppm.

It should be noted, that the facility also seems to be subject to 40 CFR 63 Subpart ZZZZ. However, WVDAQ has not been delegated authority from USEPA to enforce the area source requirements of this rule. For all practical purposes though, compliance with 40 CFR 60 Subpart IIII should ensure compliance with 40 CFR 63 Subpart ZZZZ.

The proposed modification is **not** subject to the following state and federal rules:

40 CFR 63 Subpart DDD National Emission Standards for Hazardous Air Pollutants for Mineral Wool Production.

40 CFR 63 Subpart DDD does not apply because the facility will be a minor source of Hazardous Air Pollutants.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The main non-criteria regulated pollutant that will be emitted from this facility is Manganese (the only other HAPs come from the trivial amounts produced by the combustion of fuel oil in the backup generator and from the diesel storage tanks). The following comes from EPAs Air Toxics Website:

Manganese is naturally ubiquitous in the environment. Manganese is essential for normal physiologic functioning in humans and animals, and exposure to low levels of manganese in the diet is considered to be nutritionally essential in humans. Chronic (long-term) exposure to high levels of manganese by inhalation in humans may result in central nervous system (CNS) effects. Visual reaction time, hand steadiness, and eye-hand coordination were affected in chronically-exposed workers. A syndrome named manganism may result from chronic exposure to higher levels; manganism is characterized by feelings of weakness and lethargy, tremors, a mask-like face, and psychological

disturbances. Respiratory effects have also been noted in workers chronically exposed by inhalation. Impotence and loss of libido have been noted in male workers afflicted with manganism.

EPA has classified Manganese as a Group D, not classifiable as to carcinogenicity in humans.

AIR QUALITY IMPACT ANALYSIS

Since this is a minor source as defined in 45CSR14, no modeling was performed.

MONITORING OF OPERATIONS

In addition to the monitoring required by 40 CFR 60 Subpart IIII, the facility shall monitor the following:

* The hydrated lime injection rate to the dry scrubber on a daily basis.

* The sulfur content of the slag once per month.

* The pressure drop across each baghouse.

* Visible emissions from the EAF, the raw material transfer operations, the spinner collection chambers, the hydrated lime silo and the housekeeping vacuum system at least once per month.

* Slag wool production on a monthly basis.

* Sulfur content of the fuel oil used to fire the backup generator.

* Manganese content of the slag.

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations will be achieved. Therefore it is the recommendation of the writer that permit R13-2864 for the construction of a slag wool manufacturing facility near Millwood, Jackson County, be granted to Armstrong World Industries, Inc.

Steven R. Pursley, PE
Engineer

Date